N

PHYSICS DEPT. LIBRARY

V. 9

CONTENTS

GRANTS FROM THE BACHE FUND 63
INDEX 441

MATHEMATICS

EN RIEMANN SPACES CONFORMAL TO EUCLIDEAN SPACE....*By H. W. Brinkmann* 1
AQUIAFFINE GEOMETRY OF PATHS.....*By O. Veblen* 3
OFFINE GEOMETRIES OF PATHS POSSESSING AN INVARIANT INTEGRAL.....
By L. P. Eisenhart 4
CLOSED CONNECTED SETS WHICH ARE DISCONNECTED BY THE REMOVAL OF A FINITE NUMBER OF POINTS.....*By J. R. Kline* 7
SOME EXTENSIONS IN THE MATHEMATICS OF HYDROMECHANICS.....
By R. S. Woodward 13
SETS OF CONJUGATE CYCLES OF A SUBSTITUTION GROUP.....*By G. A. Miller* 52
CONTINUOUS TRANSFORMATIONS OF MANIFOLDS.....*By Solomon Lefschetz* 90
A LEMMA ON SYSTEMS OF KNOTTED CURVES.....*By J. W. Alexander* 93
CONCERNING THE CUT-POINTS OF CONTINUOUS CURVES AND OF OTHER CLOSED CONNECTED POINT-SETS.....*By Robert L. Moore* 101
ON RIEMANN SPACES CONFORMAL TO EINSTEIN SPACES....*By H. W. Brinkmann* 172
ANOTHER INTERPRETATION OF THE FUNDAMENTAL GAUGE-VECTOR OF WEYL'S THEORY OF RELATIVITY.....*By L. P. Eisenhart* 175
TENSOR ANALYSIS WITHOUT COÖRDINATES.....*By G. Y. Rainich* 179
GEOMETRIC ASPECTS OF THE ABELIAN MODULAR FUNCTIONS OF GENUS FOUR (III).....*By Arthur B. Coble* 183
FORM OF THE NUMBER OF THE SUBGROUPS OF A PRIME POWER GROUP.....
By G. A. Miller 337
THE EINSTEIN EQUATIONS OF THE GRAVITATIONAL FIELD FOR AN ARBITRARY DISTRIBUTION OF MATTER.....*By Tracy Yerkes Thomas* 275
GROUPS OF ORDER 2^m IN WHICH THE NUMBER OF THE SUBGROUPS OF AT LEAST ONE ORDER IS OF THE FORM $1 + 4k$.....*By G. A. Miller* 326
A GENERALIZATION OF VOLTERRA'S DERIVATIVE.....*By H. L. Smith* 397
NOTE ON AN EXPERIMENTAL PROBLEM OF THE LATE A. G. WEBSTER.....
By F. L. Hitchcock 399
A NEW KIND OF REPRESENTATION OF SURFACES.....*By G. Y. Rainich* 401
THE ELECTROMAGNETIC FIELD AND CURVATURE.....*By G. Y. Rainich* 404
ON THE DEFORMATION OF AN *n* CELL.....*By J. W. Alexander* 406

ASTRONOMY

PHOTOGRAPHIC DETERMINATION OF PARALLAXES WITH THE 100-INCH REFLECTOR..
By Adriaan Van Maanen 38
LIGHT AND COLOR VARIATIONS OF NOVA AQUILAE 1918.4....*By Harlow Shapley* 39
ON IRREGULARITIES IN THE VELOCITY CURVES OF SPECTROSCOPIC BINARIES.....
By Heber D. Curtis 187
ON THE FORM OF THE DISTRIBUTION LAW OF STELLAR VELOCITIES.....
By Willem J. Luyten 191
THE SOLAR PRELUDE OF AN UNUSUAL WINTER..*By C. G. Abbot and Colleagues*.. 194
THE ASYMMETRY IN THE DISTRIBUTION OF STELLAR VELOCITIES.....
By Gustav Strömberg 312
ON THE MEAN ABSOLUTE MAGNITUDES OF THE K AND M GIANTS AND THE SYSTEMATIC ERRORS IN TRIGONOMETRIC PARALLAXES.....*By Willem J. Luyten* 317
PHOTOVISUAL MAGNITUDES OF ONE HUNDRED BRIGHT STARS..*By Edward S. King* 345

209696

REVISED MAGNITUDES AND COLOR INDICES OF THE PLANETS. *By Edward S. King* 348
PRELIMINARY NOTE. ON THE VARIATIONS OF THE SUN'S VISIBLE FEATURES ASSOCIATED WITH VARIATIONS OF SOLAR RADIATION. *By C. G. Abbot* 355
ON THE RELATIVE VELOCITY OF BLUE AND YELLOW LIGHT. *By Harlow Shapley* 386

PHYSICS

A QUANTUM THEORY OF OPTICAL DISPERSION. *By C. G. Darwin* 25
A THEORY OF THE HALL EFFECT AND THE RELATED EFFECT FOR SEVERAL METALS. *By Edwin H. Hall* 41
STOKES' LAW OF FALL COMPLETELY CORRECTED. *By R. A. Millikan* 67
GASEOUS VISCOSITY MEASURED BY THE INTERFEROMETER U-TUBE. *By Carl Barus* 71
THE REFLECTION BY A CRYSTAL OF X-RAYS CHARACTERISTIC OF CHEMICAL ELEMENTS IN IT. *By George L. Clark and William Duane* 126
ON THE ABNORMAL REFLECTION OF X-RAYS BY CRYSTALS. *By George L. Clark and William Duane* 131
ELECTRIC CONDUCTION: HALL'S THEORY AND PERKINS' PHENOMENON. *By Edwin Bidwell Wilson* 135
THE DISPLACEMENTS OF THE CAPILLARY ELECTROMETER, FOR PROGRESSIVE DILUTIONS OF THE ELECTROLYTE. *By Carl Barus* 156
THE TRANSFER IN QUANTA OF RADIATION MOMENTUM TO MATTER. *By William Duane* 158
MUTUAL ELECTROMAGNETIC MOMENTUM AND ENERGY OF A SYSTEM OF MOVING CHARGES. *By Irwin Roman* 165
FURTHER EXPERIMENTS ON THE MASS OF THE ELECTRIC CARRIER IN METALS. *By Richard C. Tolman, Sebastian Karrer, and Ernest W. Guernsey* 166
THE STRATIFIED SUBSIDENCE OF FINE PARTICLES. *By C. E. Mendenhall and Max Mason* 199
THEORY OF THE SETTLING OF FINE PARTICLES. *By Max Mason and C. E. Mendenhall* 202
THE QUASI EQUATION $P = TdV/dT$. *By Edwin H. Hall* 207
JOINING THE INFRA-RED AND ELECTRIC WAVE SPECTRA. *By E. F. Nichols and J. D. Tear* 211
THE INTERFERENCE OF LIGHT AND THE QUANTUM THEORY. *By G. Breit* 238
NOTE ON THE WIDTH OF SPECTRAL LINES DUE TO COLLISIONS AND QUANTUM THEORY. *By G. Breit* 244
CHANGE IN WAVE-LENGTH BY SCATTERING. *By P. A. Ross* 246
NOTES ON GERMANIUM OXIDE. *By E. L. Nichols* 248
THE VIBRATION OF AIR IN TUBES CAPPED AT BOTH ENDS. *By Carl Barus* 263
THE VIBRATION OF THE AIR FILAMENT IN QUILL TUBES CAPPED AT BOTH ENDS. *By Carl Barus* 266
MOTION OF AN ELECTRIC PARTICLE IN A RIEMANN SPACE. *By Arthur Bramley* 289
THE MOTION OF A FALLING CHRONOGRAPH PROJECTILE. *By L. Thompson* 329
THE MOBILITIES OF ELECTRONS IN AIR. *By Leonard B. Loeb* 335
THE THERMAL CONDUCTIVITY OF LIQUIDS. *By P. W. Bridgman* 341
THE QUANTUM INTEGRAL AND DIFFRACTION BY A CRYSTAL. *By Arthur H. Compton* 359
THE PRINCIPLE OF MINIMUM ENERGY AND THE MOTION OF FLUIDS. *By William Hovgaard* 363
THE VOLUME CHANGES OF FIVE GASES UNDER HIGH PRESSURES. *By P. W. Bridgman* 370
ACHROMATIC AND SUPERCHROMATIC FRINGES WITH A CALCITE RHOMB. *By Carl Barus* 373

VIBRATION OF THE AIR FILAMENT IN QUILL TUBES. SINGLE TELEPHONIC EXCITER
By Carl Barus 376

THE WAVE-LENGTHS OF SECONDARY X-RAYS.....
By George L. Clark and William Duane 413

THE WAVE-LENGTHS OF SECONDARY X-RAYS. (SECOND NOTE).....
By George L. Clark and William Duane 419

ENGINEERING

ON THE CONSTANT RATIO OF MEAN-TO-MID POTENTIAL OR CURRENT AT SUCCESSIVE EQUIDISTANT POINTS ALONG A UNIFORM ELECTRIC CONDUCTING LINE, REAL OR ARTIFICIAL, IN THE STEADY STATE.....*By E. A. Kennelly* 215

SOME RECENT MEASUREMENTS OF TRANS-ATLANTIC RADIO TRANSMISSION.....
By Ralph Bown 221

CHEMISTRY

ON THE HYPOTHESIS OF CONSTANT ATOMIC RADII.....*By Ralph W. G. Wyckoff* 33

COMPRESSIBILITY, INTERNAL PRESSURE AND ATOMIC MAGNITUDES.....
By Theodore W. Richards 73

THE SEPARATION OF ISOTOPES.....*By James Kendall and E. D. Crittenden* 75

AN INVESTIGATION OF THE CHEMICAL NATURE OF TWO TYPICAL ENZYMES: PANCREATIC AND MALT AMYLASES.....*By H. C. Sherman* 81

NOTE ON THE RELATIVE ABUNDANCE OF THE ELEMENTS IN THE EARTH'S CRUST...
By Alfred J. Lotka 87

THE SIGNIFICANCE OF THE EXPERIMENTALLY DETERMINED CRYSTAL-STRUCTURES OF THE ALKALI POLYHALIDES.....*By George L. Clark* 117

THE CRITICAL AND DISSOCIATION POTENTIALS OF HYDROGEN.....
By A. R. Olson and George Glocker 122

A THEORY OF COLOR PRODUCTION. I.....*By Julius Stieglitz* 303

A THEORY OF COLOR PRODUCTION. II, INORGANIC COMPOUNDS.....
By Julius Stieglitz 308

PRELIMINARY ATTEMPT TO MEASURE GRAVIMETRICALLY THE DISTANCE-EFFECT OF CHEMICAL AFFINITY....*By Theodore W. Richards and William T. Richards* 379

GEOLOGY AND PALEONTOLOGY

DROWNED CORAL REEFS SOUTH OF JAPAN.....*By W. M. Davis* 58

REMOVAL OF THE BLOCK TO SELF-FERTILIZATION IN THE ASCIDIAN CIONA.....
By T. H. Morgan 170

STUDIES OF THE LARGER TERTIARY FORMINIFERA FROM TROPICAL AND SUB-TROPICAL AMERICA.....*By T. Wayland Vaughan* 253

THE MARGINAL BELTS OF THE CORAL SEAS.....*By W. M. Davis* 292

THE DEPTH OF CORAL-REEF LAGOONS.....*By W. M. Davis* 296

BOTANY

A NOTE ON THE STATISTICS OF CYCLIC GROWTH.....*By H. S. Reed* 65

THE ROOT SYSTEM OF EPIGAEA REPENS AND ITS RELATION TO THE FUNGI OF THE HUMUS.....*By W. T. Councilman* 279

ZOÖLOGY

CIRCUS MOVEMENTS OF LIMULUS.....*By W. H. Cole* 30

THE MECHANISM OF SELECTIVE BACTERIOSTASIS.....*By John W. Churchman* 78

THE NERVE NET IN THE EARTHWORM: PRELIMINARY REPORT.....
By W. M. Smallwood 95

THE SYMMETRY OF THE INTERNAL EARS IN FLATFISHES.....*By J. V. Leech* 286

209696

THE ORIGIN OF SECRETORY GRANULES ..... *By Robert H. Bowen* 349
THE EFFECTS OF CUTTING THE GIANT FIBERS IN THE EARTHWORM, EISENIA FOETIDA (SAV.) ..... *By L. W. Yolton* 383
SYMBIOSIS BETWEEN TERMITES AND THEIR INTESTINAL PROTOZOA ..... *By L. R. Cleveland* 424

GENETICS

STUDIES OF SUBSPECIFIC HYBRIDS IN PEROMYSCUS ..... *By F. B. Sumner* 47
THE REDUCTION DIVISION IN HAPLOID, DIPLOID, TRIPLOID AND TETRAPLOID DATURAS ..... *By John Belling and A. F. Blakeslee* 106
THE VARIATION AND INHERITANCE OF MILK CHARACTERS ..... *By Tage Ellinger* 111
CROSSING-OVER AND THE THEORY THAT THE GENES ARE ARRANGED IN THE CHROMOSOMES IN SERIAL ORDER ..... *By H. S. Jennings* 141
SOME CONSEQUENCES OF DIFFERENT EXTENTS OF INTERFERENCE IN THE CROSSING-OVER OF THE GENES ..... *By H. S. Jennings* 147
GENETIC VARIATION IN LINKAGE VALUES ..... *By J. A. Detlefsen and L. S. Clemente* 149
BODY BUILD AND ITS INHERITANCE ..... *By C. B. Davenport* 226
THE HEREDITY OF MICROSCOPIC HAIR CHARACTERS IN PEROMYSCUS ..... *By R. R. Huestis* 352
SIZE-FACTORS AND SIZE-INHERITANCE ..... *By F. B. Sumner* 391
CONTROL OF THE APPEARANCE OF PUPA-LARVAE IN MIASTOR ..... *By R. G. Harris* 407

PHYSIOLOGY AND PATHOLOGY

HYDROHEPATOSIS, A CONDITION ANALOGOUS TO HYDRONEPHROSIS ..... *By P. D. McMaster and P. Rous* 19
NOVOCAINE AND CURARISATION ..... *By H. Laugier and R. Legendre* 21
UNDERNUTRITION AND ITS INFLUENCE ON THE METABOLIC PLANE OF STEERS ..... *By F. G. Benedict and E. G. Ritzman* 23
LEUCOCYTIC SECRETIONS ..... *By Alexis Carrel, M.D.* 54
MECHANICS OF LOCOMOTION IN AMOEBA ..... *By S. O. Mast* 258
CORRELATION BETWEEN PHYSICAL AND MEDICAL FINDINGS ON NORMAL EARS ..... *By John P. Minton and J. Gordon Wilson, M.D.* 269
THE ABSOLUTE WEIGHT OF THE HEART AND THE SPLEEN ..... *By Raymond Pearl and Agnes Latimer Bacon* 428
THE NATURE OF THE RESISTANCE TO SEEDLING BLIGHT OF CEREALS ..... *By James G. Dickson, Sophia H. Eckerson, and Karl P. Link* 434

ANTHROPOLOGY AND PSYCHOLOGY

THE CORRELATION OF RESPIRATORY AND CIRCULATORY DATA FOR ADULT MALES ..... *By Clark Wissler* 252
MEASUREMENTS IN THE EXPRESSION OF EMOTION IN MUSIC ..... *By C. E. Seashore* 323